Weekly Report for 09/15/2014

Highlights

• Completed a technical note "Radiation power on SCU1 for extreme beam orbits." (Kathy Harkay)

• Contributed to technical note "Beam Loss Monitor Calibration at the ID6 Superconducting Undulator Prototype (SCU0)" (J. Dooling lead author). (Kathy Harkay)

APS Renewal and Upgrade

• Reviewed the MBA injection section layout from documents provided by H. Cease. Also reviewed possible beam dumps designs for an APS-U abort system. Met with Nancy Grossman, Glenn Decker, and Jeff Dooling to discuss these and also radiation calculations. (Kathy Harkay)

MCR Operations

Storage Ring Operations

• Reviewed ray tracing for ID1/SCU1 with a photon absorber aperture of 17.45 mm (J. Lerch). Discovered that he applies the angle x' at the entrance of the BM dipole. He said M. Jaski also does this, but I checked Jaski's results for the SCU0 test chamber, and he applies x' at the exit. (Kathy Harkay)

Linac Operations

• The linac L4 and L5 sled forward power indication had to be corrected. Looking below and comparing the Dataset 1 to Dataset 2 you can see that shifting the modulator trigger from -7 to -6.8 us the indicated klystron forward and sled forward power decreased to something we believe. (Stan Pasky)

• Thanks for your time Art!!! I truly hope someone has learned how to make the same adjustments you made today as well as understand how and where to connected the power monitor and how and where to move the modulator trigger in reference to the SLED fill. (Stan Pasky)

• Maybe someone can put together a tech note/checklist with graphics, pictures as it would make it easier in the future to repeat the steps you performed today. (Stan Pasky)

ControlName	Dataset1	Dataset2	Dtst2-Dtst1	Toler.	Description (Stan Pasky)
• --- (Stan Pasky)					
• L5:TM:modTrigAO	-7	-6.8	0.2	0 (Stan Pasky)	
• L5:TM:modTrigMonCC	-7	-6.8	0.2	0	L5ModulatorTrigger (Stan Pasky)
• L4:TM:modTrigAO	-6.7	-6.6	0.1	0 (Stan Pasky)	
• L4:TM:modTrigMonCC	-6.7	-6.6	0.1	0	L4ModulatorTrigger (Stan Pasky)
• L4:TM:sledTrigAO	-0.40683	-0.35948	0.047342	0.037 (Stan Pasky)	
• L4:TM:sledTrigMonCC	-0.40683	-0.3609	0.04593	0.0359	L4SledTrigger (Stan Pasky)
• ControlName	Dataset1	Dataset2	Dtst2-Dtst1	Toler.	Description (Stan Pasky)

• -- (Stan Pasky)

• L4:SD:DC1ARF.VAL L4SledFwdPower (Stan Pasky)	8.8783e+07	6.5925e+07	-2.2858e+07	1.55e+06
• L5:SD:DC1ARF.VAL L5SledFwdPower (Stan Pasky)	8.3978e+07	6.9473e+07	-1.4506e+07	8.41e+05
• L4:KY:DC2ARF.VAL L4KlystronFwdPower (Stan Pasky)	1.8121e+07	1.2913e+07	-5.2079e+06	2.88e+05
• L5:KY:DC2ARF.VAL L5KlystronFwdPower (Stan Pasky)	1.8092e+07	1.5118e+07	-2.9741e+06	9.04e+04

ITS Operations
• RF conditioning and beam operation of a refurbished 3G1 thermionic rf gun. (Stan Pasky)

Procedures
• Reviewed Top-up Configuration Control procedure and updated. (Karen Schroeder)

Training
• Attended EPICs classes. (Karen Schroeder)

• Provided operator training for both the linac/par and booster. (Stan Pasky)

MCR Operations administrative/misc.
• Attended OPS Directorate (Karen Schroeder)

• Reviewed and approved non-RSS work requests and RSS work requests when CCSM was not available. (Karen Schroeder)

• Sent out notice for all tunnel closures and updated/provided SR tunnel closure sign-offs, MPS validation signoffs, Top-up sign-offs and generated BPLD validation list. (Karen Schroeder)

APS Machine Studies

Storage Ring Studies
• With J. Dooling, carried out first studies with the new ID1 BLM. Acquired data with MPS dumps and kicking a single bunch into ID1 using IK1. (Kathy Harkay)

• Checked the SCU0 skew quadrupole feedforward (FF) table, and found that it needed to be modified (coupling change was -0.1% over 700 A main coil current). With the new table, the coupling change is less than 0.005%. (Kathy Harkay)

• Produced schedule for and assisted MCR with storing beam during RF conditioning with beam. (Karen Schroeder)

• Assisted MCR with non-beam studies when there was limited personnel available. (Karen Schroeder)

• Coordinated multiple emergency accesses during start-up. (Karen Schroeder)

• Monitored RF conditioning and sent plots and info to Trento klystron instabilities. Informed MCR so

they could get them resolved with the RF group. (Karen Schroeder)

• Assisted MCR with diagnosing multiple problems during start-up. (Karen Schroeder)

• Coordinated study with S30 beamline personnel/F.C. which would require shutters open. Noticed most on-line/off-line keys were still not returned to MCR and informed Glagola. (Karen Schroeder)

• Produced machine studies schedule and modified it as needed. (Karen Schroeder)

APS Machine Research and Development

Storage Ring Research and Development

• Worked on calculating the radiation power incident on the SCU1 for orbit errors. Added calculations for an array of x,x' values. (Kathy Harkay)

• With A. Brill and J. Grimmer installed FO BLM in ID1. (Jeff Dooling)

• Attended the weekly SCU1 meeting in Bldg. 314 and discussed installation of the FO BLMs in the SCU1 cryostat. (Jeff Dooling)

• During discussion of future studies at the Thursday Studies meeting, requested a location to install a Pb:Glass calorimeter element to do fast pressure monitoring from an ID straight section. (Jeff Dooling)

• An ID vacuum chamber is present in the SS but with no beam line. (Jeff Dooling)

• The calorimeter element could be placed in the tunnel just downstream of the beam stop. (Jeff Dooling)

• Diagnostic would only involve existing hardware. (Jeff Dooling)

• Talked with C. Prokuski (PSC-PA) about retrieving pinger magnets from IPNS RCS. (Jeff Dooling)

Linac Research and Development

• Continued support of the linac pcgun installation. (Stan Pasky)

• Worked on installation of pcgun laser optics in the linac tunnel. Due to time constraints caused by RG2 gun problems and other issues, was not able to complete laser alignment in the tunnel. (Jeff Dooling)

• Alignment and high-power testing will be completed during injector studies in November. Requesting 2 days of restricted access for alignment. (Jeff Dooling)

Other Research and Development

• EC: Discussed how to calculate the beam spectrum with L. Boon. (Kathy Harkay)

APS Machine Software

Storage Ring

• wrote getS2ScopeData to read the P0Feedback waveform data from S2 scope and write into a SDDS file. (Hairong Shang)

Injectors

• Updated linac PEMtool to to incorporate L3:AM1 to turn On prior to starting LTP:B1 conditioning. Doing so will keep a gun inhibit from happening. (Stan Pasky)

General

• debugged and tested sddscomplexpseudoinverse 1) debugged and got complex svd work, tested to give correct U, S, Vt matrices 2) however, complex matrix multiplication which is used to produce inverse matrix did not give correct answer, debugged and found the parameter of ldvt (leading array of Vt) was not correct, fixed it and replaced dzgemm routine by zgemm (dzgemm does not work, do not know why), finally, it gave the correct pseudoinverse matrix 3) wrote matlab script to read SDDS complex input file, compute pseudoinverse and write inverse complex matrix into SDDS file to be able to compare with sddscomplexpseudoinverse. Test with m<n, m=n, and m>n cases, they all agree. Installed sddspseudoinverse. (Hairong Shang)

Publications, papers and report

• Generated four plots of SCU0 vertical chamber alignment for inclusion in a paper by M. Penicka, W. Jansma, et al. (Kathy Harkay)

• Reviewed draft SCU0 journal paper and supplied comments to Y. Ivanyushenkov. (Kathy Harkay)

• Completed a technical note "Radiation power on SCU1 for extreme beam orbits." (Kathy Harkay)

• Contributed to technical note "Beam Loss Monitor Calibration at the ID6 Superconducting Undulator Prototype (SCU0)" with J. dooling, lead author. I developed the IK2 kicker configuration to kick a single bunch deliberately into ID6 only, and we carried out the machine studies together to calibrate the ID6 BLM varying the bunch current. (Kathy Harkay)

• Completed draft of FO BLM calibration technote; gave to co-author K. Harkay for review. (Jeff Dooling)

Meetings, workshops, conferences, committees, LMS related, and reviews

• Participated in a review of the SLAC FACET program as a member of the SAREC committee. Submitted written report on 4 (of 26) proposals. (Kathy Harkay)

• Participated in Diffraction Limited Storage Rings workshop organizing committee meeting. (Kathy Harkay)

• Attended F.C. pre-run briefing. (Karen Schroeder)

Miscellaneous

• Reviewed list of newly up-dated SR procedures and entered the appropriate ones into Operator Required reading. (Karen Schroeder)

• Provided Shang and Soliday with the information on new or changed power supplies and IDs so scripts could be updated and updated P.S. corrector management tool with the new information. (Karen Schroeder)

• Checked multiple medm and alarm handlers for changes made during shutdown and asked the appropriate operators to update them. (Karen Schroeder)

• Led daily 4 o'clock meetings once when the meetings resumed. (Karen Schroeder)

• attended EPICS training courses. (Hairong Shang)